NON-PUBLIC?: N
ACCESSION #: 9110250031
LICENSEE EVENT REPORT (LER)

FACILITY NAME: St. Lucie Unit 1 PAGE: 1 OF 04

DOCKET NUMBER: 05000335

TITLE: REACTOR TRIP DURING CONTROL ROD DRIVE MOTOR-GENERATOR SET
SYNCHRONIZATION DUE TO PERSONNEL ERROR
EVENT DATE: 09/18/91 LER #: 91-006-00 REPORT DATE: 10/15/91

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Michael J. Snyder, Shift Technical Advisor TELEPHONE: (407) 465-3550

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: SB COMPONENT: TRP MANUFACTURER: A485
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 18 September, 1991, with Unit 1 in mode 1 at 100%, operators prepared to return the 1A Control Element Drive Mechanism (CEDM) Motor Generator (MG) set to service following maintenance on its flywheel bearing. At 1043, while a utility non-licensed operator was manually synchronizing the 1A MG set to the CEDM bus, the generator output breaker was closed out of phase with the running MG set. This resulted in an instantaneous overcurrent condition on the CEDM bus. The overcurrent condition opened 7 Trip Circuit Breakers (TCBs) and removed power to the CEDMs. All Control Element Assemblies (CEAs) then fully inserted. The main turbine automatically tripped upon sensing an undervoltage condition on the CEDM bus and the 2 remaining TCBs opened. The operators then implemented Standard Post Trip Actions, and the normal Reactor Trip Recovery procedure.

The root cause for the out of phase synchronization of the MG set was that a non-licensed operator made a personnel error while attempting to manually synchronize the 1A MG set to the CEDM bus. The non-licensed operator closed the generator output breaker out of phase while he was in an incorrect section of the procedure. Contributing factors to this event included: on the scene supervision of this load threatening activity was absent, a lack of specific technical knowledge by the operator, no pre-evolution brief between maintenance and operating personnel was held, and the procedure for MG set operation contained some human factor deficiencies.

Corrective actions were to: counsel the individuals involved on this event, emphasize the importance of on the scene supervision and pre-evolution briefings, provide additional training on MG set operation to non-licensed operators, revise the procedure for CEDM MG Set Operation, and verify the proper operation of the 1A MG set.

END OF ABSTRACT

DESCRIPTION OF THE EVENT

On 18 September, 1991, with Unit 1 in mode 1 at 100%, operators prepared to return the 1A Control Element Drive Mechanism (CEDM)(EIIS:AA) Motor Generator (MG)(EIIS:AA) set to service following maintenance on its flywheel bearing. At 1043, while a utility non-licensed operator was manually synchronizing the 1A MG set to the CEDM bus, the generator output breaker was closed out of phase with the running MG set, resulting in an instantaneous overcurrent condition on the CEDM bus, The high current condition opened 7 Trip Circuit Breakers (TCBs)(EIIS:AA) and removed power to the CEDMs. All Control Element Assemblies (CEAs) then fully inserted. The main turbine automatically tripped upon sensing an undervoltage condition on the CEDM bus, generating a loss of load Reactor Protection System (EIIS:JC) signal, and the remaining 2 TCBs opened. The operators then implemented EOP-1, Standard Post Trip Actions.

During the post trip recovery, water level in the 1A Steam Generator (SG) (EIIS:SG) was regained to normal level by using the 1A 15% Feedwater Regulating Valve(EIIS:JB). Auxiliary Feedwater Actuation System-2 (AFAS) (EIIS:BA) actuated due to the 1B SG water level reaching its initiation setpoint (19.5% narrow range). As a precaution, the Main Steam Isolation Valves were shut after a minor steam leak at a steam trap was noted post trip. The Atmospheric Dump Valves were used to remove decay heat. Normal SG levels were regained, AFAS was reset, two sets of Safety

Function Status Checks were performed as per EOP-2, Reactor Trip Recovery, and the unit was stabilized in mode 3, Hot Standby.

CAUSE OF THE EVENT

The root cause of this event was a personnel error by a utility non-licensed operator while not adequately following an approved procedure. The cause for the out of phase synchronization of the MG set was that the non-licensed operator was using the wrong section of the procedure for placing a MG set in service. While attempting to manually synchronize the 1A MG set to the CEDM bus, the operator closed the generator output breaker out of phase.

A contributing factor to this event was that there was no operations supervisory oversight present at the 1A MG set during this evolution. Also, testing indicated a weakness among other non-licensed operators in the area of MG set theory. Another contributing factor was that a pre-evolution brief between maintenance and operations personnel on returning the 1A MG set to service was not held. Additionally, there were some human fact
rs deficiencies of the procedure for CEDM MG Set
Operation, OP 1-0110020 Rev 9. For example, the title for section 8.2 "Single MG Line-up" did not indicate that this section is to be used when the unit is shutdown.

There were no unusual work location characteristics that directly contributed to the error.

ANALYSIS

This event is reportable under the requirements of 10CFR50.73.a.2.iv as an event that resulted in a manual or automatic actuation of any Engineered Safety Feature.

The plant response during this event was bounded by section 15.2.9 of the St. Lucie 1 FUSAR, "Loss of Offsite Power." The plant response was much more conservative than that described in the FUSAR for several reasons. 1) Offsite power was not lost to auxiliary equipment, only power to all CEDM holding coils was removed. 2) RCS temperatures did not go above normal operating temperatures because the Steam Bypass Control System operated post trip.

The health and safety of the public were not at risk at any time during this event.

CORRECTIVE ACTIONS

1) Senior Plant and Operations management personally counseled the crew involved in the event on the failure of the team to perform to departmental expectations. These expectations were transmitted to the remaining operating crews through a departmental letter.

2) Operations management emphasized the importance of on the scene supervision for potentially load threatening activities. Procedures will be identified and changed to require a Senior Reactor Operator's presence during critical non-licensed operators (NLOs) activities.

3) Diagnostic testing validated a weakness among NLOs in the area of MG set theory. Additional training is now being given on that subject to NLOs.

4) Operations management emphasized the importance of pre-evolution briefings between maintenance and operations personnel before performing potentially load threatening activities.

5) The Operations department has revised OP 1-0110020, GFDM MG Set Operation, with respect to human factors considerations. The St. Lucie 2 equivalent procedure has been similarly revised.

6) A Human Performance Enhancement Study review was performed on this event and validates the conclusions of this LER.

7) The 1A MG set generator, voltage regulator, synchronization circuitry, and output breaker were verified to be functioning properly. The 1A MG set was then returned to service.

8) FPL Engineering has been directed to prepare a design change for the installation of a MG set synchronization check circuit for an additional level of unit reliability and protection.

ADDITIONAL INFORMATION

Failed Component Identification:

No. 216 Steam Trap
Armstrong Machine Works

Previous Similar Events:

LER 335-84-003, describes a reactor trip during a startup following refueling when an operations trainee improperly paralleled the 1B MG set to the CEDM bus.

ATTACHMENT 1 TO 9110250031 PAGE 1 OF 1

P.O. Box 128, Ft. Pierce, FL 34954-0128

FPL

OCT 15 1991
L-91-272
10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 91-06
Date of Event: September 18, 1991
Reactor Trip During CEA Motor-Generator Set Synchronization
Due to Personnel Error

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Should there be any questions on this information, please contact us.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

DAS/JJB/kw

Attachment

cc: Stewart D. Ebneter, Regional Administrator, USNRC Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

DAS/PSL #536-91

an FPL Group company

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